Dialogues in Philosophy, Mental and Neuro Sciences

In collaboration with the Section Philosophy & Psychiatry
of the European Psychiatric Association

Crossing Dialogues Association

ORIGINAL ARTICLE

Rumination and lived temporality: a neurophenomenological view

Rocco Marchitelli
École normale supérieure Paris-Saclay, Paris (France)

ABSTRACT
Rumination is a repetitive and self-focused style of thinking that reflects how individuals relate to themselves and their experience of time. Drawing on recent studies that combine functional magnetic resonance imaging with self-rated assessment tools, particularly instruments designed to measure patterns of ruminative thought, this paper explores how different styles of rumination relate to the organization of spontaneous brain activity. Rather than interpreting these patterns solely through a neurocognitive lens, I propose a neurophenomenological reading in which brooding reflects a temporal contraction and emotional entrapment, while reflection may preserve a degree of openness and intentionality. Inspired by Francisco Varela's framework, I argue that integrating first-person data with brain imaging findings allows for a richer understanding of how psychological vulnerability is linked with the temporal architecture of the ruminative self.

KEYWORDS: Rumination, Resting-State Networks, Neurophenomenology, fMRI, Structured Belief States, Mental Health Interventions

ARTICLE HISTORY
Received: July 11, 2025
Accepted: September 30, 2025
Firstly published online: October 21, 2025

Copyright © 2025 by Ass. Crossing Dialogues, Italy

CORRESPONDENCE
Rocco Marchitelli, Ph.D.
École normale supérieure Paris-Saclay
4, avenue des Sciences,
91190, Gif-sur-Yvette Paris (France)
Email: rocco.marchitelli@yahoo.it
Tel. +39-377-307-2859
ORCID: 0000-0003-1994-2332

DIAL PHIL MENT NEURO SCI 2025; 18(1):1-4

INTRODUCTION

Rumination is not a behavior that can be directly observed, nor a discrete neural event that can be localized in the brain. It is a lived phenomenon — an internal style of thinking that unfolds in time and is accessible primarily through subjective report. The Ruminative Response Scale (RRS), a self-rated psychometric tool introduced by Nolen-Hoeksema & Morrow (1991), offers a structured way to access this inner landscape. Later work by Treynor, Gonzalez, & Nolen-Hoeksema (2003) refined the scale to capture two distinct but interrelated dimensions: brooding, characterized by passive, judgmental dwelling on negative emotions; and reflection, a more purposeful and problem-oriented form of self-focus.

In recent years, studies combining RRS scores with functional magnetic resonance imaging (fMRI) have begun to reveal how these subjective tendencies may correspond to different patterns in the organization of spontaneous brain activity. A longitudinal study by Marchitelli et al. (2024), conducted in a community sample of adolescents, demonstrated that shifts in ruminative styles were closely aligned with functional alterations across core resting-state networks, including the default mode, salience, limbic, and frontoparietal systems. These findings underscore the value of pairing first-person data with brain imaging measures, particularly when seeking to understand psychological vulnerability as an embodied process.

This paper proposes a neurophenomenological interpretation of rumination, in which both brooding and reflection are understood not merely as cognitive styles, but as temporal structures of lived experience. Drawing on Francisco Varela's notion of "mutual circulation" between first-person and third-person data (Varela, 1996), I explore how the RRS can serve as a bridge between subjective temporality and neural dynamics. My aim is to contribute to a more integrative understanding of rumination — not only as a pattern of self-referential thinking, but as a disruption in the way time is inhabited and the self is constituted.

BROODING AND REFLECTION AS TEMPORAL STYLES OF SELFHOOD

The RRS distinguishes between two subtypes of rumination: brooding and reflection. While both involve self-focused attention, they differ in tone, intentionality, and psychological outcome. Brooding is typically associated with passivity, emotional entrapment, and a sense of helplessness. It often involves repetitive thoughts about personal shortcomings or past failures and has been consistently linked to increased risk for depression. Reflection, by contrast, is more deliberate and problem-solving in nature. It entails a willingness to examine one's thoughts and feelings with the aim of gaining insight or resolution.

From a neurophenomenological perspective, these two styles of rumination can be understood as distinct temporal configurations. Brooding may correspond to a form of temporal closure: the subject becomes fixated on past experiences, unable to move forward or reorient toward future possibilities. Time feels stagnant, looping, or collapsed. Reflection, on the other hand, may preserve a degree of temporal openness. Even when focused on past events, it retains a forward-directed intentionality — a movement toward understanding, integration, or change.

Recent theoretical advances offer a formal framework for understanding rumination as structured modes of lived temporality. Da Costa et al. (2024) propose modeling first-person experience as a structured belief state, where generative passages relate subjective temporality to empirical brain data — without reducing experiential richness. Within this framework, the RRS can be interpreted as indexing distinct generative architectures of rumination: brooding corresponds to rigid, high-precision belief patterns that contract temporal scope, whereas reflection embodies flexible, exploratory inference toward future possibilities. Da Costa et al. (2024) offer a valuable formalization of subjective temporality, which I treat as a heuristic rather than a comprehensive theory. While it helps model structural features of rumination, it does not exhaust the richness of lived experience. Da Costa himself acknowledges this, noting that active inference may illuminate diverse forms of consciousness without claiming theoretical closure. Empirical validation comes from longitudinal fMRI research (Marchitelli et al., 2024), which found brooding associated with reduced connectivity in limbic and salience networks, and reflection linked to increased activity in medial and dorsolateral prefrontal regions — suggesting that ruminative styles manifest as distinct neurophenomenological profiles shaped by both subjective experience and brain dynamics.

Beyond brooding and reflection, neurophenomenology offers a flexible framework for exploring additional facets of rumination captured by diverse self-rated instruments. As Smith and Alloy (2009) note, rumination encompasses multiple cognitive and emotional dimensions — such as intrusive ideation, stress reactivity, and disrupted goal monitoring — reflected in tools like the Rumination on Sadness Scale (Conway et al., 2000), Stress-Reactive Rumination

Scale (Robinson and Alloy, 2003), and Scott–McIntosh Rumination Inventory (Scott and McIntosh, 1999). These instruments reveal distinct experiential patterns that, when interpreted through generative modeling and correlated with fMRI data, can inform therapeutic planning. Clinicians may tailor interventions to the specific temporal constriction reported by the individual, with techniques ranging from metacognitive training and narrative reconstruction to somatic regulation and neuromodulation. Together, subjective and neural data guide an integrative therapeutic process aimed at restoring temporal flexibility and future-directed agency.

CONCLUSIONS

Understanding rumination as a disruption of lived temporality invites us to rethink its nature — not merely as a maladaptive cognitive habit, but as an experiential shift in how time is inhabited and selfhood is constituted. Through a neurophenomenological lens, brooding and reflection emerge as temporally distinct modes of being — each marked by unique subjective configurations and neural correlates. Longitudinal fMRI studies, alongside nuanced self-report instruments, provide converging evidence that rumination is both embodied and structured.

By modeling these styles as generative architectures of experience, clinicians and researchers gain new tools for therapeutic insight. Self-rated scales capture patterns of experiential constriction; fMRI reveals the biological underpinnings of those patterns across resting-state networks. This interplay suggests that healing unfolds not only through cognitive change but through the restoration of temporal openness. Interventions rooted in this view aim to reorient individuals from looping self-focus toward adaptive future-directed agency — supporting them in reinhabiting the present with renewed intentionality and emotional continuity.

REFERENCES

Conway M, Csank PAR, Holm SL, Blake CK. (2000) On the interpersonal consequences of rumination. J Pers Soc Psychol, 78(6), 1150–1169.

Da Costa L, Sandved-Smith L, Friston K, Ramstead MJD, Seth AK. (2024) A Mathematical Perspective on Neurophenomenology. arXiv preprint arXiv:2409.20318. https://arxiv.org/pdf/2409.20318

Marchitelli R, Paillère Martinot ML, Trouvé A, Banaschewski T, Bokde ALW, Desrivières S, Flor H, Garavan H, Gowland P, Heinz A, Brühl R, Nees F, Papadopoulos Orfanos D, Paus T, Poustka L, Hohmann S, Holz N E, Vaidya N, Fröhner JH, Smolka MN, Walter H, Whelan R, Schumann G, Martinot J-L, Artiges E, IMAGEN consortium. (2024) Coupled changes between ruminating thoughts and resting-state brain networks during the transition into adulthood. Mol Psychiatry, 29(12), 3769–3778.

Nolen-Hoeksema S, and Morrow J. (1991) A prospective study of depression and posttraumatic stress symptoms after a natural disaster: The 1989 Loma Prieta earthquake. J Pers Soc Psychol, 61(1), 115–121.

Robinson MS, and Alloy LB. (2003) Negative cognitive styles and stress-reactive rumination interact to predict depression: A prospective study. Cognitive Therapy and Research, 27(3), 275–291.

Scott WD, and McIntosh WD. (1999) The development of a trait measure of rumination. Pers Individ Dif, 26(5), 1049–1056.

Smith JM, and Alloy LB. (2009) A roadmap to rumination: A review of the definition, assessment, and conceptualization of this multifaceted construct. Clin Psychol Rev, 29(2), 116–128.

Treynor W, Gonzalez R, Nolen-Hoeksema S. (2003) Rumination reconsidered: A psychometric analysis. Cogn Ther Res, 27(3), 247–259.

Varela FJ. (1996) Neurophenomenology: A methodological remedy for the hard problem. J Consciousness Stud, 3(4), 330–349.